

THE PORTERSVILLE MEMBER OF THE CONEMAUGH FORMATION IN MUSKINGUM COUNTY, OHIO

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The problem on which this paper reports progress concerns the Portersville member of the Conemaugh Formation in Muskingum County. To quote from Condit's bulletin on the Conemaugh Formation in Ohio, the Portersville is usually found as "a black calcareous shale, rich in pyrite and carbonaceous matter and often containing masses of fossils preserved as pyrite. In some places a layer of black nodular limestone overlies the shale, beautifully preserved fossils occur, the fauna being especially rich in minute pelecypods and gastropods."¹ The object of this investigation was to study the fauna to see if there are any significant differences in the fauna found in different localities.

As a result of a field study of the member, collections of fossils were made in eight different localities in this region and carefully studied. In two of these Coal Hollow located in the southwest part of section 22 in Bluerock Township, and Norwich located in the northwest part of section 7 in Union Township about twelve miles north of Coal Hollow, I found the best preserved and most abundant fauna. Therefore more time was spent on these faunas and consequently much of the discussion in this paper will concern these two localities.

These two places had some fossils in common but in many cases the forms which would be abundant in one would not be abundant in the other. The forms which were found to be abundant in both localities are:

Crinoid stems

Chonetes verneuillanus

Derbya crassa

Two of these three forms which are abundant in both localities are the brachiopods, *Chonetes verneuillanus* and *Derbya crassa*, which are fairly abundant throughout the whole region not only in this horizon but in others. There are only two other forms which are found in both localities, a species of *Worthenia* and *Orthaceras rushense*; both of these forms are abundant at

¹Condit, Geological Survey of Ohio, Fourth Series Bulletin No. 17, p. 276.

Norwich but scarce at Coal Hollow. Farmers near Coal Hollow digging for underlying Anderson coal report the finding of coiled cephalopods, a species of which I report for Norwich.

The forms which are found at Coal Hollow but which are not reported for the Norwich section are:

Rhombopora lepidodrendroides
Chonetes granulifer
Chonetes granulifer var. *armata*
Productus cora (of authors)
Astartella vera
Edmondia aspenwallensis
Leda bellistriata
Nuculopsis ventricosa
Parallelodon obsoletus
Parallelodon tenuistriatus
Pharkidonotus percarinatus
Plant remains

Of these twelve forms, it is significant that six of them are pelecypods while in the Norwich section there are no pelecypods found at all. Inasmuch as *Chonetes granulifer* and *Chonetes granulifer* var. *armata* have not been reported for this horizon before I shall describe them briefly. The specimens in nearly all cases have been preserved as pyrite or marcasite.

1892. *Chonetes coronata* Conrad, Hall, Nat. Hist. of N. Y. Pal., Vol. VIII, Part I, p. 303, Pl. xvi, figs. 10, 11.

Hamilton group, Darien, N. Y.

1912. *Chonetes granulifer* Owen, Condit, Conemaugh Formation in Ohio, p. 300-301, Pl. XIII, fig. 3.

Ames limestone, New Concord, Ohio.

Chonetes granulifer upon superficial examination could easily be mistaken for *Chonetes verneuillanus*. There are, however, several outstanding differences. *C. granulifer* has a broad, shallow mesial sinus on the pedicle valve, while *C. verneuillanus* has a rather deep mesial sinus on the pedicle valve. Growth lines also seem to be more pronounced on *C. granulifer* than on *C. verneuillanus*. The hinge line of *C. granulifer* appear to be shorter and beak not so elevated as on *C. verneuillanus*. On the whole, *C. granulifer* appears to be somewhat smaller in size than *C. verneuillanus*. The dimensions of an average individual are length of hinge lines, 9 mm. and height, 7 mm.

1915. *Chonetes granulifer* var. *armatus* Girty, Wewoka Formation of Okla., p. 62, Pl. VII, fig. 2-4.

Wewoka formation, Oklahoma.

While I found only two specimens of *Chonetes granulifer* var. *armata*, I think they are distinctive enough to be placed provisionally

in this classification. They differ from *C. granulifer* in that they possess numerous small spine bases located in no particular order over the shell but follow roughly the plications running outward from the beak to the edge of the shell. On one specimen there is a fairly pronounced mesial sinus while on the other this sinus is broad and rather shallow as on a true *C. granulifer*. In neither case was the beak as high as that of *Chonetes verneuili*. On both specimens the hinge line was extended so that there were little ear-like projections on either end of the hinge line. The dimensions of these specimens were:

hinge line 7 mm.	length 4 mm.
8 mm.	5 mm.

On the other hand, the forms which are found at Norwich constitute a somewhat different type of fauna, which consists of brachiopods and cephalopods instead of brachiopods and pelecypods as at Coal Hollow. These forms which are found at Norwich but not at Coal Hollow are:

Lophophyllum profundum

Ambocoella planoconvexa

Orbiculoidea missouriensis

Spirifer cameratus

Schizostoma catilloides

Orthaceras sp.

Temnocheilus forbesianus

• The species *Orthaceras rushense* McChesney is abundant at Norwich but is found only occasionally at Coal Hollow. The form *Ambocoella planoconvexa* is very abundant here and could be called the dominant form in spite of the fact that it is somewhat undersize as compared with forms taken from other formations.

Between the localities of Coal Hollow and Norwich, there is a locality, the Eckleberry farm, the fossils of which have been reported in Condit's Bulletin on the Conemaugh Formation.² This farm is located in section 10 of Bluerock Township, 2½ miles north of Coal Hollow and 12½ miles southwest of Norwich. Here are found twenty-five forms reported, four of which are found in both of the other localities mentioned. These four are:

Crinoid fragments

Derbya crassa

Chonetes verneuili

Orthaceras rushense

²Op. cit., pp. 276-277.

SUMMARY OF FAUNAL DISTRIBUTION

	Coal Hollow	Norwich	Section 1	Section 6	Section 8	Section 10	Section 12	Section 13	
<i>Lophophylloides profundum</i>		aa	r(?)						
Crinoid stems	a	a	r	r		r	r	a	
<i>Rhombopora lepidodendroides</i>	a								
<i>Ambocoelia planoconvexa</i>		aaa				r	r		
<i>Chonetes granulifer</i>	a								
<i>Chonetes granulifer armata</i>	r								
<i>Chonetes verneuili</i>	aa	a	r	r					
<i>Derbya crassa</i>	aaa	aa	a	a	a	a	r	a	
<i>Orbiculoidea Missouriensis</i>		r							
<i>Productus cora</i> (of authors)	aa								
<i>Spirifer cameratus</i>		r			r(?)				
<i>Astartella vera</i>	r								
<i>Edmondia aspenwallensis</i>	a		r	r	a	a	r(?)	a	
<i>Leda bellistriata</i>	a				a			r	
<i>Nuculopsis ventricosa</i>	r								
<i>Paralldodon obsoletus</i>	r								
<i>Parallelodon tenuistriatus</i>	a			r	r				
<i>Pharkidonotus percarinatus</i>	a		r	a					
<i>Pleurotomaria carbonaria</i>					r	r(?)	a		
<i>Schizostoma catilloides</i>		r							
<i>Worthenia</i> sp.	r	a	r		r	r		r(?)	
<i>Orthaceras</i> sp.		r							
<i>Orthaceras rushense</i>	r	a							
<i>Temnocheilus forbesianus</i>		r							
Plant remains	r								

a = abundant.

aa }
aaa } = very abundant.

r = rare.

r(?) = questionably present.

Three of the forms found at this section are found only at Norwich but not at Coal Hollow. Six of the forms found are common to both Coal Hollow and the Eckleberry farm but not to Norwich. These forms are *Rhombopora lepidodendrendes*, *Productus cora* (of authors), *Edmondia aspenwallensis*, *Nuculopsis ventricosa*, *Leda bellistriata*, and *Astartella vera*. This horizon at the Eckleberry farm contains a number which are not found in either of the other localities. There are also six different types found here that are not reported for the type section at Portersville, in Perry County, about 15 miles southwest of Coal Hollow.

From this evidence we are bound to notice several salient facts. First, the faunas found in these three localities differ in several respects.

Second, the fauna found in Coal Hollow seems to be one containing brachiopods with an abundance of pelecypods and a sprinkling of other forms including one bryozoan. The fauna found at Norwich is one containing brachiopods, gastropods and cephalopods but no pelecypods. The Norwich collection also contains many specimens of the coral *Lophophyllum profundum* which may or may not be significant. The species found in the Eckleberry fauna appear to be more closely related to the forms found in Coal Hollow than to those found at Norwich. However, there are enough of the Norwich forms found to classify this fauna as one which is intermediate between Coal Hollow and Norwich. Evidently some of the Norwich forms reached this far south but did not get as far as Coal Hollow and vice versa. The number of species found in these three localities is far less than the number found in the type section at Portersville in Perry County. The faunas of these localities also seem to contain a much more predominantly brachiopod fauna than Condit reports for the type section. However, these variations might be due to differences in the living conditions in the different localities.

Third, the fauna varies so much from locality to locality, that it would be difficult to identify the number by means of its fossils alone.

In comparing the size of the species in this horizon with that of the same species in other horizons as reported in the literature, it is found that some of the forms are undersize while others are larger than usual. Three of the pelecypods found at Coal Hollow are undersize, two are normal, and one is larger than the

dimensions commonly given for an average individual of that species. The forms which are abundant in both localities, *Chonetes verneuillanus* and *Derbya crassa*, are the normal size according to the dimensions given for these two species. Of the seven different forms found only at Norwich, four are of average size, one, *Lophophyllum profundum*, is larger than usual, and two are smaller than the dimensions given. One of these latter is *Ambocoelia planoconvexa*, which is by far the most abundant species at Norwich, is distinctly below normal in size.